



September 7, 2012

L-2012-322
10 CFR 50.73

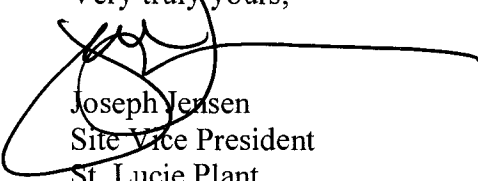
U-S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Re: St. Lucie Unit 1
Docket No. 50-335
Reportable Event: 2012-003-01
Date of Event: March 31, 2012

Manual Trip during Steam Bypass Control System Post-Modification Testing

The attached supplement to Licensee Event Report 2012-003 is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,



Joseph Jensen
Site Vice President
St. Lucie Plant

JJ/rcs
Attachment

TEZZ
NRR

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION (10-2010)					APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013 Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resourse@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.																																								
LICENSEE EVENT REPORT (LER)																																													
1. FACILITY NAME St. Lucie Unit 1					2. DOCKET NUMBER 05000335		3. PAGE 1 OF 3																																						
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NAME Richard Sciscente - Principal Engineer, Licensing							TELEPHONE NUMBER (Include Area Code) 772-467-7156																																						
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) <p>On March 31, 2012 at 0022 EDT, St. Lucie Unit 1 was in Mode 1 at 10% reactor power and performing post modification testing (PMT) of the steam bypass control system (SBCS) when the reactor was manually scrammed after a steam bypass control valve opened unexpectedly at 0019 EDT. Immediately following the reactor scram the steam bypass control valve closed, terminating the cooldown. Additionally, Operators closed the main steam isolation valves in accordance with Emergency Operating Procedure (EOP-01), "Standard Post Trip Actions" due to steam generator pressure decreasing to less than 750 psia. All control element assemblies (CEAs) fully inserted. No automatic safety system actuations were required and none occurred. RCS heat removal was maintained with auxiliary feedwater and atmospheric dump valves. The offsite power grid was available and stable.</p> <p>The root cause for failure of the control valve was less than adequate analyses supporting a recently implemented design change and less than adequate post modification testing that failed to provide appropriate contingency actions to mitigate potentially unfavorable SBCS test responses.</p> <p>Corrective actions include isolating the malfunctioning SBCS valve until it can be redesigned and replaced. SBCS capability is provided by the remaining four SBCS valves.</p>																																													

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

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NARRATIVE

Description of the Event

On March 31, 2012 at 0022 EDT, St. Lucie Unit 1 was in Mode 1 at 10% reactor power and performing post modification testing of the SBCS when the reactor was manually scrammed after a steam bypass control valve [PCV] opened unexpectedly at 0019 EDT. Immediately following the reactor scram the steam bypass control valve closed, terminating the cooldown. Additionally, Operators closed the main steam isolation valves in accordance with EOP-01 due to steam generator pressure decreasing to less than 750 psia. All CEAs fully inserted. No automatic safety system actuations were required and none occurred. RCS heat removal was maintained with auxiliary feedwater and atmospheric dump valves. The offsite power grid was available and stable.

Cause

The root cause for failure of the control valve was less than adequate analyses supporting a recently implemented design change and less than adequate PMT that failed to provide appropriate contingency actions to mitigate potentially unfavorable SBCS test responses.

Analysis of the Event

The review and analysis of the design change and subsequent post maintenance test requirements did not account for fluid momentum loads and binding of the valve plug in the full open position. The resulting internal forces exceeded the capability of the actuator and caused a steam dump valve to fail open under dynamic load. The engineering change did not require dynamic testing to validate that actual valve forces were within actuator capacity.

Analysis of Safety Significance

The failed steam bypass control valve closed when steam pressure was reduced during the cooldown terminating the event immediately following the reactor scram. Upon closure of the failed steam bypass control valve, RCS temperature stabilized at 505 degrees and began to recover. The failed steam bypass control valve was subsequently isolated by a manual valve.

During post trip recovery actions the Shift Manager determined that EOP-05, "Excess Steam Demand" was required to be entered as a result of not meeting the Reactor Trip Safety Function (Reactor Coolant System (RCS) average temperature between 525 and 535 degrees). The procedure was exited with no actions taken when temperature increased into the required band. With the exception of not meeting the Reactor Trip Safety Function Status Check for RCS Heat Removal in EOP-02, "Reactor Trip Recovery" as a result of low reactor coolant system temperature, there were no equipment complications identified post reactor trip, and all CEAs fully inserted. No automatic safety system actuations were required and none occurred. RCS heat removal was maintained with auxiliary feedwater and atmospheric dump valves. The offsite power grid was available and stable.

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NARRATIVE

The Conditional Core Damage Probability (CCDP) and Conditional Large Early Release Probability (CLERP) values were evaluated for the stated event and were found to be significantly below the thresholds required by RG-1.174 for the risk to be "Small", where CCDP is below 1.0E-06 and CLERP is below 1.0E-07. Given the response of the plant and small CCDP and CLERP values, the health and safety of the public was not affected by this event.

This licensee event report is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A) as an event or condition that resulted in manual or automatic actuation of the Reactor Protection System including reactor scram or reactor trip.

Corrective Actions

The corrective actions listed below are entered into the site corrective action program. Any changes to the actions will be managed under the corrective action program.

1. The failed steam bypass control valve was manually isolated, and steam bypass capability is provided by the remaining four SBCS pressure control valves.
2. The Steam Bypass Control System pressure control valves are being redesigned and replaced.

Similar Events

A search of the St. Lucie corrective action database for three years was performed and identified no issues that were related to the faults identified with this report.

Failed Component(s)

Copes-Vulcan 10", 600 # Class, Generation II Tandem (Balanced) control valve with a SD-ATI L165SRR68.6 dual acting piston actuator

Manufacture

Copes-Vulcan, SPX Valves & Controls